

1 THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY
2 OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

3

4 1. A method of encoding a frame counter used in communication between a sender and a
5 receiver comprising the steps of:

- 6 a) maintaining a sequence counter and a frame counter at the sender;
7 b) computing new values of the frame counter such that the frame counter is unique and
8 recoverable from an encoded value of the frame counter and said sequence counter.
9

10 2. A method according to claim 1 wherein the sequence counter is incremented each time a
11 message is sent.
12

13 3. A method according to claim 1 wherein the frame counter is congruent to the sequence
14 counter modulo 256.
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16 4. A method according to claim 1 wherein the encoded value of the frame counter is formed
17 by removing the least significant byte of the frame counter.
18

19 5. A method according to claim 4, wherein the frame counter is recovered by concatenating
20 the encoded frame counter with the sequence counter.
21

22 5. A method according to claim 4 wherein the encoded value of the frame counter is 3 bytes
23 in length.
24

25 6. A method of transmitting messages from a sender to a recipient over a wireless channel,
26 the messages including a sequence counter and a frame counter, the method comprising the steps
27 of:

- 28 a) establishing initial values of the sequence counter and the frame counter at said
29 sender;

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- 1 b) providing the initial values of said frame counter and said sequence counter to said
- 2 recipient;
- 3 c) sending compressed messages including the value of the sequence counter and not
- 4 the frame counter;
- 5 d) monitoring for an acknowledgement of receipt by said recipient;
- 6 e) when no acknowledgment is received, sending uncompressed messages until an
- 7 acknowledgement of receipt is received from said recipient;
- 8 f) incrementing said sequence counter;
- 9 g) establishing the next value of the frame counter as the integer next larger than
- 10 previous value of the frame counter which is congruent to the sequence counter
- 11 modulo 256.

12
13 7. A method of transmitting messages from a sender to a recipient over a wireless channel,
14 the messages including a sequence counter and a frame counter, the method comprising the steps
15 of:

- 16 a) establishing initial values of the sequence counter and the frame counter at said
- 17 sender;
- 18 b) providing the initial values of said frame counter and said sequence counter to said
- 19 recipient;
- 20 c) sending compressed messages including the value of the sequence counter and not
- 21 the frame counter;
- 22 d) periodically sending uncompressed messages including the value of the frame
- 23 counter according to predefined criteria;
- 24 f) incrementing said sequence counter;
- 25 g) establishing the next value of the frame counter as the integer next larger than
- 26 previous value of the frame counter which is congruent to the sequence counter
- 27 modulo 256.

28
29 8. A method according to claim 5 wherein the predefined criteria are that an uncompressed
30 message is sent after a predetermined number of compressed messages are sent.

- 1
- 2 9. A method according to claim 6 wherein the predetermined number is in the range 2 to 10.
- 3
- 4 10. A wireless device for receiving communications from other wireless devices in a wireless
- 5 network, the device comprising:
- 6 a) storage for a frame counter;
- 7 b) a receiver for obtaining a message over the wireless network, the message including
- 8 a sequence counter and data encrypted using a secret key and a new value of the
- 9 frame counter as input to the encryption;
- 10 c) a decryptor configured to perform decryption complementary to the encryption used
- 11 in the message, the decryptor having access to the secret key;
- 12 d) a processor connected to the message receiver and configured to recover the value of
- 13 the frame counter from a sequence counter in the message and provide the frame
- 14 counter and encrypted data from the message to the decryptor.
- 15
- 16 11. A wireless device for sending communications to other wireless devices in a wireless
- 17 network, the device comprising:
- 18 a) storage for a frame counter and a sequence counter;
- 19 b) a processor to compute a new value of the frame counter such that the frame counter
- 20 is unique and recoverable from an encoded value of the frame counter and said
- 21 sequence counter;
- 22 c) a transmitter for sending a message over the wireless network, the message including
- 23 a sequence counter and data encrypted using a secret key and the new value of the
- 24 frame counter as input to the encryption.